World War 2 Paraset Resistance Radio

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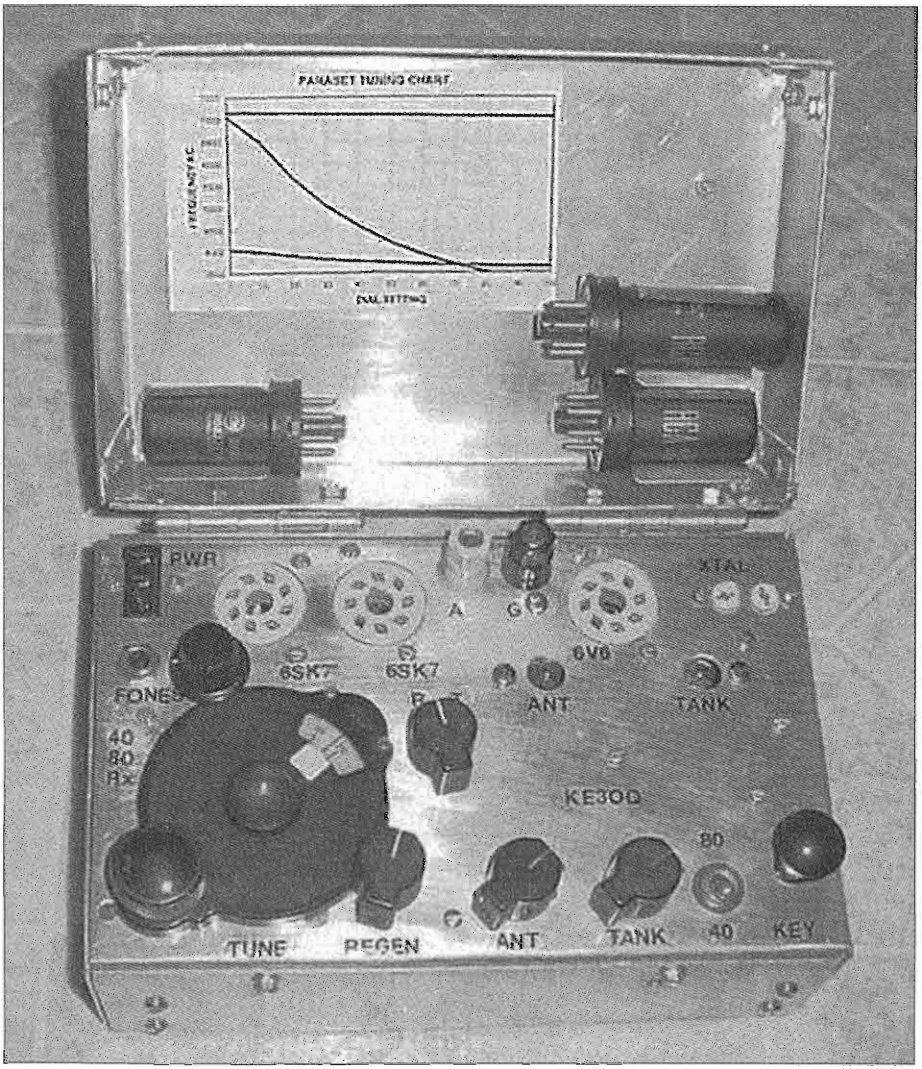
I recently built a replica of a simple Receiver /Transmitter set that was originally used in Europe as a compact radio for clandestine communications by resistance and spy forces behind enemy lines during WW2. The radio was used in Norway, France and other occupied countries as a means of obtaining and of sending information to and from British headquarters. It was small, of simple design and could be powered from a 6V car battery via a vibrator power supply or from house current if a suitable power supply was available. This project may appeal to ER readers who are looking for an interesting and rewarding project.

The receiver is a simple two tube regenerative design and the transmitter is a single tube, crystal controlled oscillator, both assembled on a small chassis and contained within the confines of a small metal box. There is a lot of detail regarding this radio on a web site by IKØMUZ and several amateurs in Europe and North America have reproduced the radio from the information presented.

The receiver uses two 6SK7 tubes. The first 6SK7 is a regenerative detector followed by a second 6SK7 used as an audio amplifier. The LC arrangement is such that the band from 3 to 8 MHz is covered with 180 degrees of tuning dial rotation. This makes the receiver very difficult to fine tune and I made modifications to this arrangement to select only small portions for use in the ham bands. I used a three position, three-pole rotary switch to change the capacitance across the coil to spread out the bands on 80 and 40 meters. I left one position to allow for the original tuning and the second and third positions cover 80 and 40 meters. An attached diagram [page 17] outlines the modifications I made. The final choice of capacitors is by trial and error but the values given may be used as a starting point.

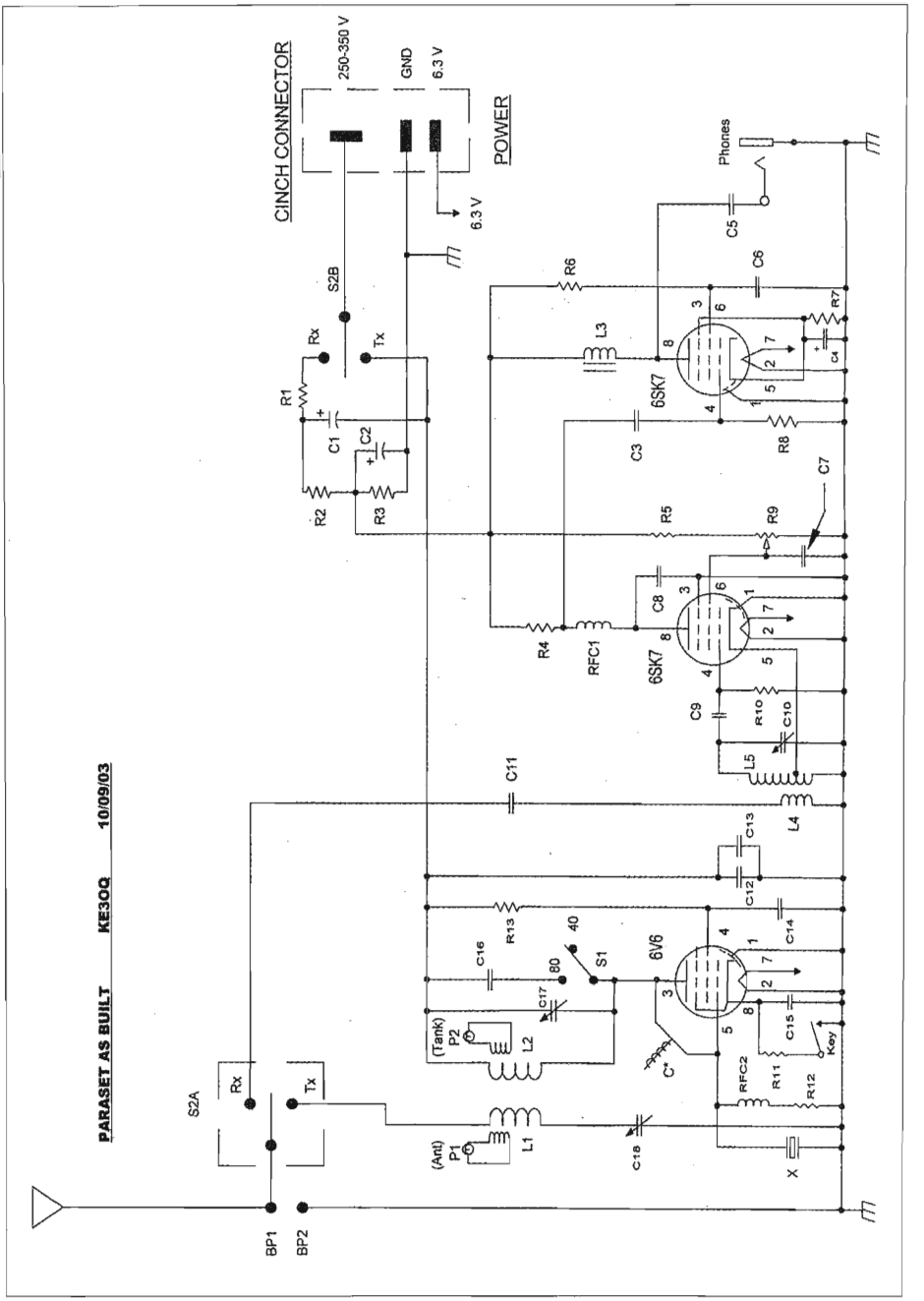
The transmitter employs a single 6V6. It is a crystal-controlled circuit and loads very well into every antenna I have, producing about 5 to 7 watts output. I used a micro-switch as a key with a small knob attached directly to the switch actuator arm. The original spring arm is too soft for comfortable keying and I plan to replace this arm with a stiffer piece of metal in the near future. There are two small pilot lights attached to pickup coils mounted inside the antenna and tank coils for proper tuning adjustment. These work very well for maximum power transfer indication.

The power supply I used is a receiver type with about 260 volts output. The filaments are 6.3 volts and a 3-wire cable and Cinch connector make the hook-up cable. I believe you can increase the HV to about 350 V with no problem and probably obtain higher transmit output. Care must be exercised around these HV supplies to avoid serious shock damage.



The Paraset transmitter/receiver is built in a homemade aluminum case.

The parts all came out of my junk box collection. I hand fabricated the metal pieces to the dimensions found on the web site using 16 ga aluminum. The chassis/panel can be formed in a vise if care is taken making the bends. I scored the break lines with a scratch awl before attempting the break and found the resulting edge was very square with the fold following the impression. The coils were wound on plastic forms using a 1-inch diameter pill container for the RX coil and a 1.5-inch diameter sink drain tube for the TX coil. The dial used is an old National vernier type and the control knobs are military surplus. I believe the original dial was a National Type K with the friction wheel mounted to drive the dial but the use of the vernier dial makes mounting and ad-



Complete as-built schematic of the 3-tube Paraset clandestine transceiver. (See the parts list on page 16.)

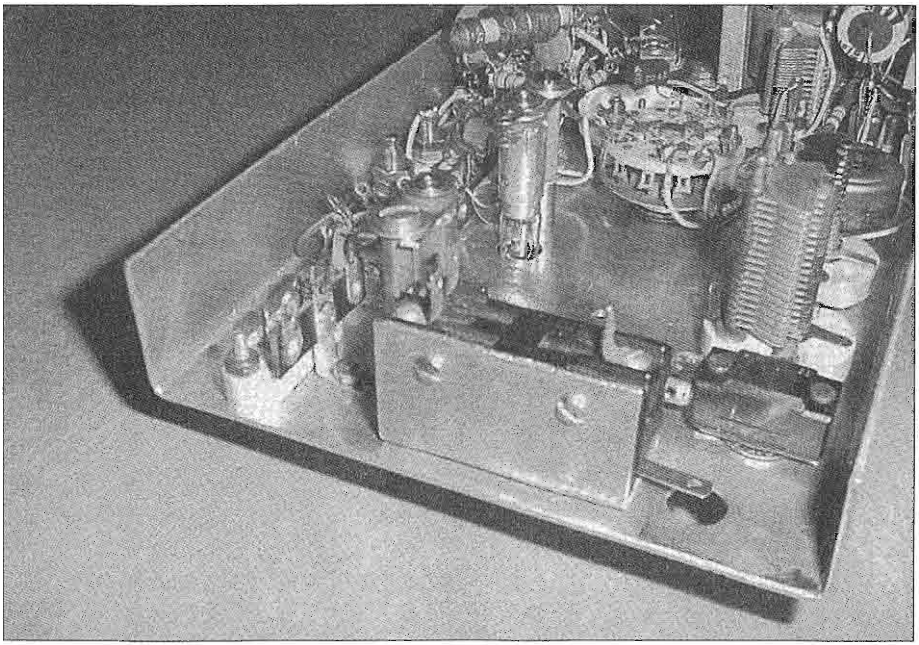
PARTS LIST

R1 1.5k: 1W
R2 10k: 3W
R3, R4, R5: 100k
R6: 75k
R7: 250 ohm
R8: 250k
R9 20k pot
R10: 1 meg
R11: 200 ohm
R12, R13: 20k

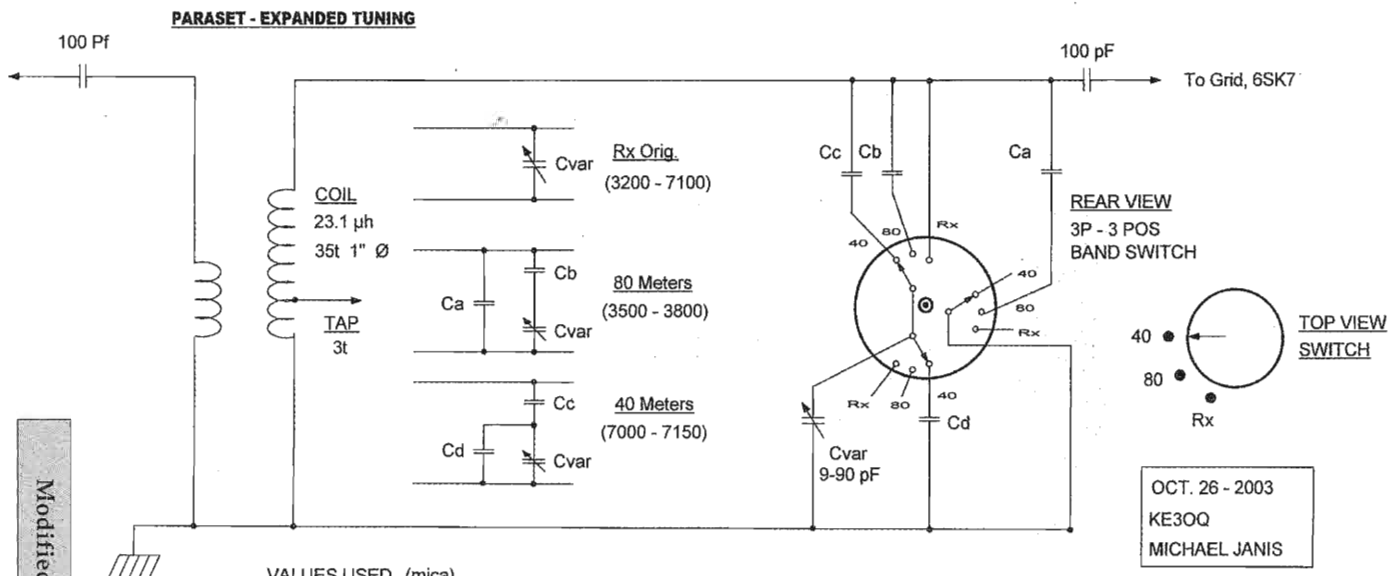
C1, C2: 22 µfd, 450 V
C3: .01
C4: 25 µfd, 25 V
C5, C6, C12: .1
C7: 2 µfd, 200 V
C8, C9, C11, C16: 100 pf silver mica
C10, C17, C18: 100 pf variable
C13, C14, C15: .002
C*: 2 twists (gimmick capacitor)

RFC1, RFC2: 2.5 mH
L1: 1 ½" dia, #22, 22 turns, 7/8" long
L2: 1 ½" dia, #16, 18 turns, 1 1/16 long
(L1 spaced 5/16" from L2)
L3: 15-40 Hy choke
L4: 1" dia, #22, 4 turns, 1/8" long
L5: 1" dia, #22, 35 turns, 7/8" long, tap at 3t from gnd, space L4 to L5 at 1/8".

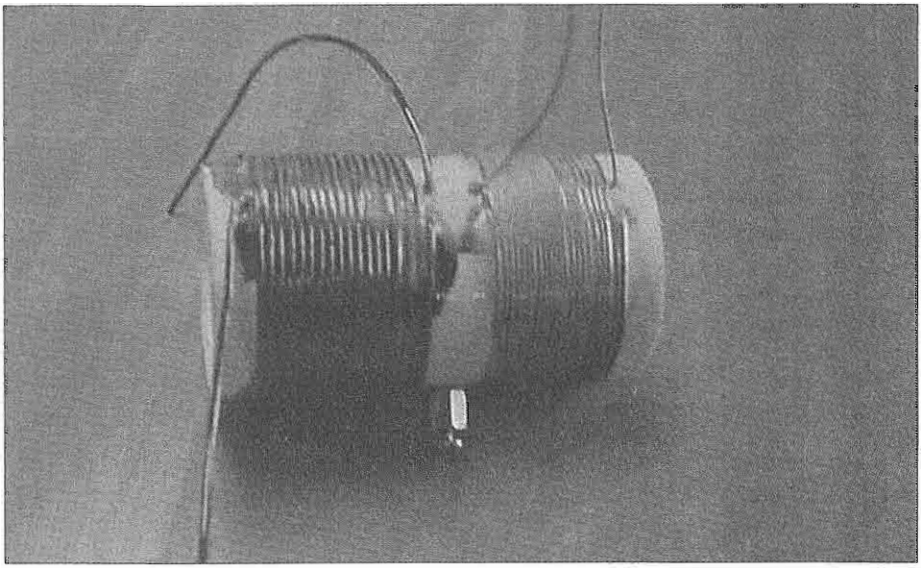
P1: 28 V pilot lamp
P2: 14 V pilot lamp
Pickup coils: 2T, #16 inside L1 & L2 at hot ends.
BP1: Antenna binding post
BP2: Ground binding post
X: crystal
S2: 2 pole, 2 position, N
S1: 1 pole, 2 position, N



The microswitch which acts as a CW key is shown here at the very end of the chassis. It is activated by pushing the lever with a pencil through the chassis hole at the right.



Modified tuning schematic



A closeup view of the tank coil shows how it is wound on an old pill bottle.

justment very easy.

The initial trials went well, with the receiver coming to life immediately. Plenty of signals were present with good sensitivity but poor selectivity as expected. The regeneration control was surprisingly very smooth and well controlled. The transmitter gave a bit more trouble due to a bad tank tuning capacitor but once changed the unit took right off.

This radio is a lot of fun to use as originally designed but I plan to do some experimenting with this set to see if the operation can be optimized. I plan to change the grid leak to a higher value to see if it will make the detector more sensitive as well as fit a small variable capacitor to match the antenna more efficiently on receive to avoid dead spots when tuning with some antennas. Receive volume is not as strong as I would like and I want to add another output stage, possibly changing the second 6SK7 to a dual function tube which would provide a power output stage. As there are a lot of ER readers out there who are experienced with these old designs, I would appreciate any feedback and comment on this historic radio.

This was an interesting project and several photos and the schematic are attached for reference. Typing "PARASET" into your Internet search engine and going to the GREY-GREEN site can access the web site on the Internet.

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